KIT, DATAGRIP INSTALLATION, NM4

INSTALLATION PROCEDURE

This procedure applies to NARKOMED 4 anesthesia machines with or without an O.R. DATA MANAGER (with a 286 CPU) as noted in the following text:

1. Turn the System Power switch to OFF, disconnect AC power from the machine, and disable all circuit breakers by pulling out their pushbuttons with a knife or sharp object.

CAUTION: Do not plug or unplug the remote display with power applied.

2. Remove all connections from the patient interface panel on the left side of the monitor box.

3. Remove the monitor box cover.

CAUTION: Use ESD protection when handling circuit assemblies.

NOTE: Skip to Step 5 if the machine does not have an ORDM.

4. Disconnect the ORDM cables from J3, J13 and J14 on the backplane circuit board, and separate the floating ORDM power and keyboard connectors.

5. Remove both processor assemblies from the card cage. Mark the upper and lower assemblies so they can be reinstalled in their original positions.

6. Remove the four backplane mounting screws at connectors J35 and J38. See Figure 1.

7. Replace these screws with four 3-48 x 5/16 in. pan head screws (P/N HW02031).

8. On the front side of the backplane support, install four 3-48 x 5/16 in. hex standoffs and #3 lockwashers as shown in Figure 1.

9. Install the NM4 Datagrip PCB assembly onto the standoffs with four 3-48 x 5/16 in. pan head screws. Ensure that the board is oriented with J1 at the top.

10. Install the ten-cond. ribbon cable (P/N 4112579-005) from J1 on the NM4 Datagrip board to J31 on the backplane. See Figure 1.

11. Carefully reinstall the two processor assemblies in their correct positions in the card cage.

INSTALLATION PROCEDURE (continued)

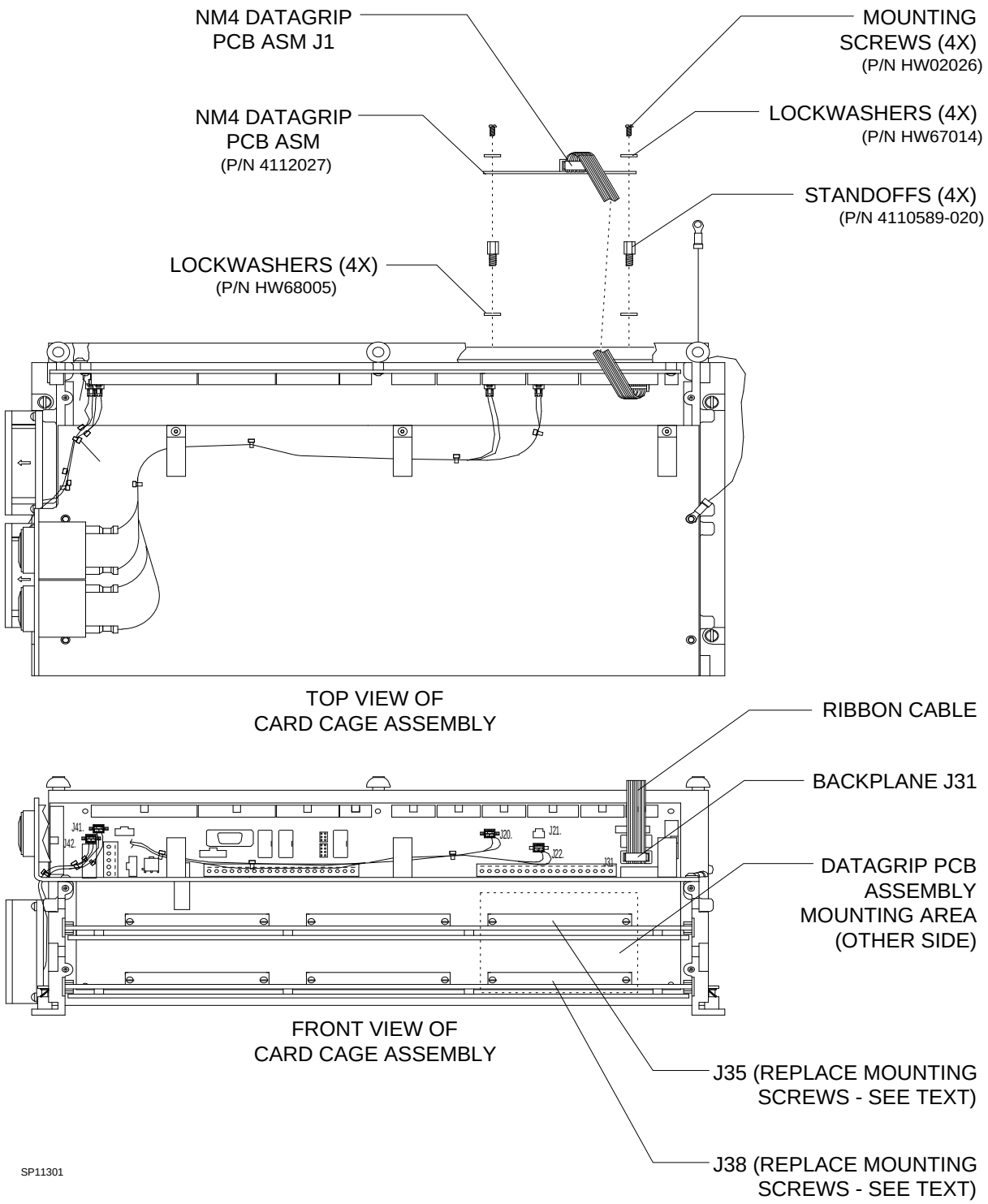

NM4 DATAGRIP PCB ASM J1
MOUNTING SCREWS (4X) (P/N HW02026)
NM4 DATAGRIP PCB ASM (P/N 4112027)
LOCKWASHERS (4X) (P/N HW67014)
STANDOFFS (4X) (P/N 4110589-020)
LOCKWASHERS (4X) (P/N HW68005)
TOP VIEW OF CARD CAGE ASSEMBLY
RIBBON CABLE
BACKPLANE J31
DATAGRIP PCB ASSEMBLY MOUNTING AREA (OTHER SIDE)
FRONT VIEW OF CARD CAGE ASSEMBLY
J35 (REPLACE MOUNTING SCREWS - SEE TEXT)
J38 (REPLACE MOUNTING SCREWS - SEE TEXT)
SP11301

Figure 1: NM4 DATAGRIP PCB ASSEMBLY INSTALLATION

INSTALLATION PROCEDURE (continued)

12. Remove the blank insert from the top position of the patient interface panel at the left side of the monitor chassis.

13. Install the Datagrip connector panel and cable assembly in the top position using the hardware removed in the previous step.

14. Connect the cable from the Datagrip interface panel to J2 on the NM4 Datagrip PCB assembly as shown in Figure 2.

NOTE: Skip to Step 33 if the machine does not have an ORDM.

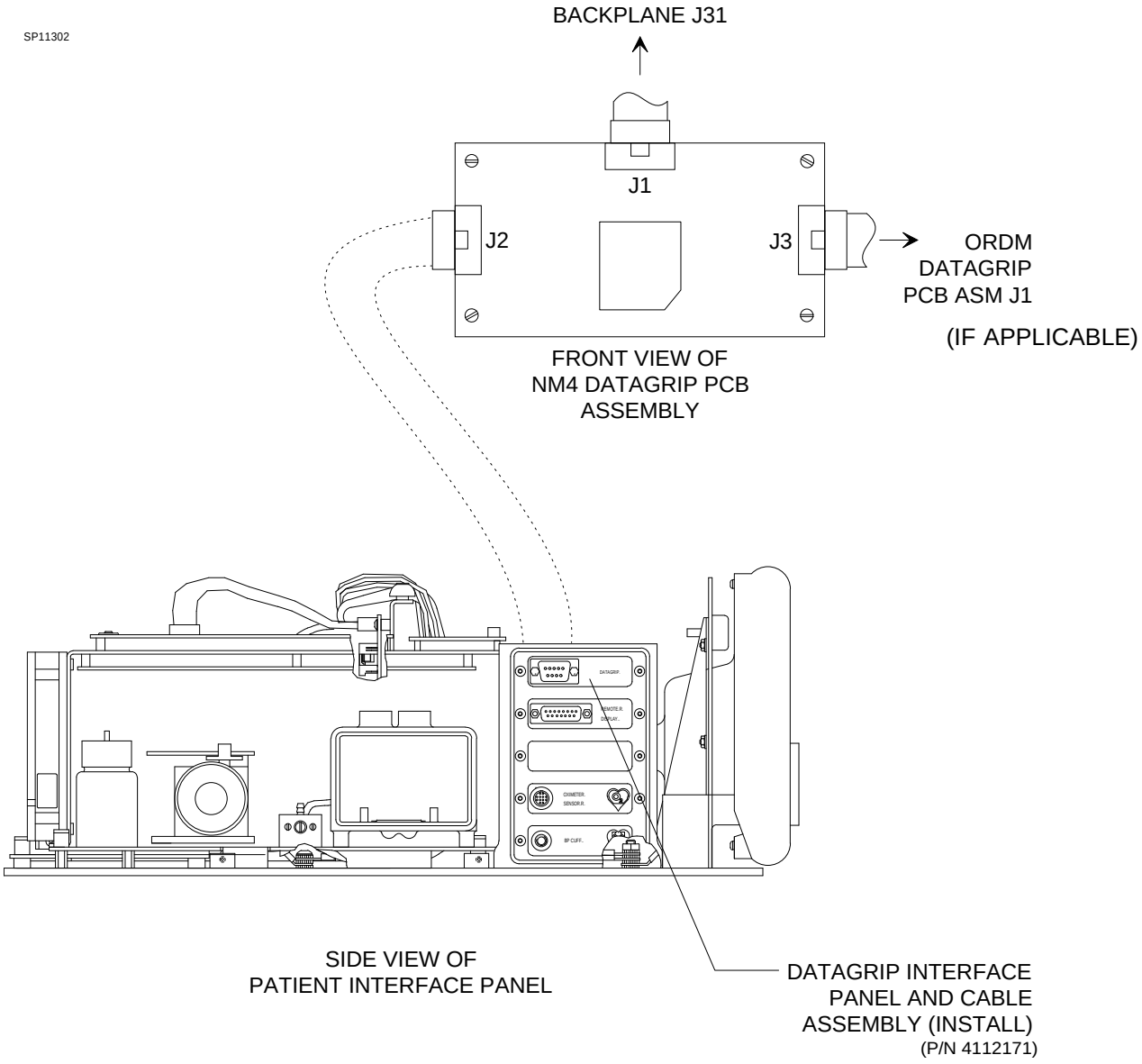


Figure 2: DATAGRIP INTERFACE PANEL AND CONNECTION

INSTALLATION PROCEDURE (continued)

15. Remove any disk from the ORDM disk drive.

16. Remove the four screws holding the right front panel of the ventilator box, and remove the panel.

17. Loosen the two captive screws holding the ORDM sub-assembly to the floor of the ventilator box. Carefully slide the sub-assembly forward while feeding its cables down into the ventilator box, and remove the sub-assembly from the ventilator box.

18. Examine the ORDM compartment in the ventilator box and verify that there is no comb style cable conduit in the rear of the ventilator box. Remove any comb style conduit before reinstalling the ORDM sub-assembly.

19. On the ORDM sub-assembly, disconnect all cables from the video interface PCB assembly (disconnect both ends of the cable connected to J4 on the video interface board). See Figure 3.

20. Remove the video interface board from the back of the ORDM sub-assembly.

21. Install the ORDM Datagrip PCB assembly (P/N 4112239) with two 6-32 x 7/16 in. standoffs. Ensure that J2 on the PCB assembly faces the CPU board as shown in Figure 3.

22. Install the new (Rev. B or later) video interface PCB assembly (P/N 4110994) onto the standoffs with the screws that were previously removed. Ensure that the J3 header on the ORDM Datagrip board mates properly with J4 on the video interface board.

23. Reconnect the cables to J1, J2, J3 and J5 on the new video interface board.

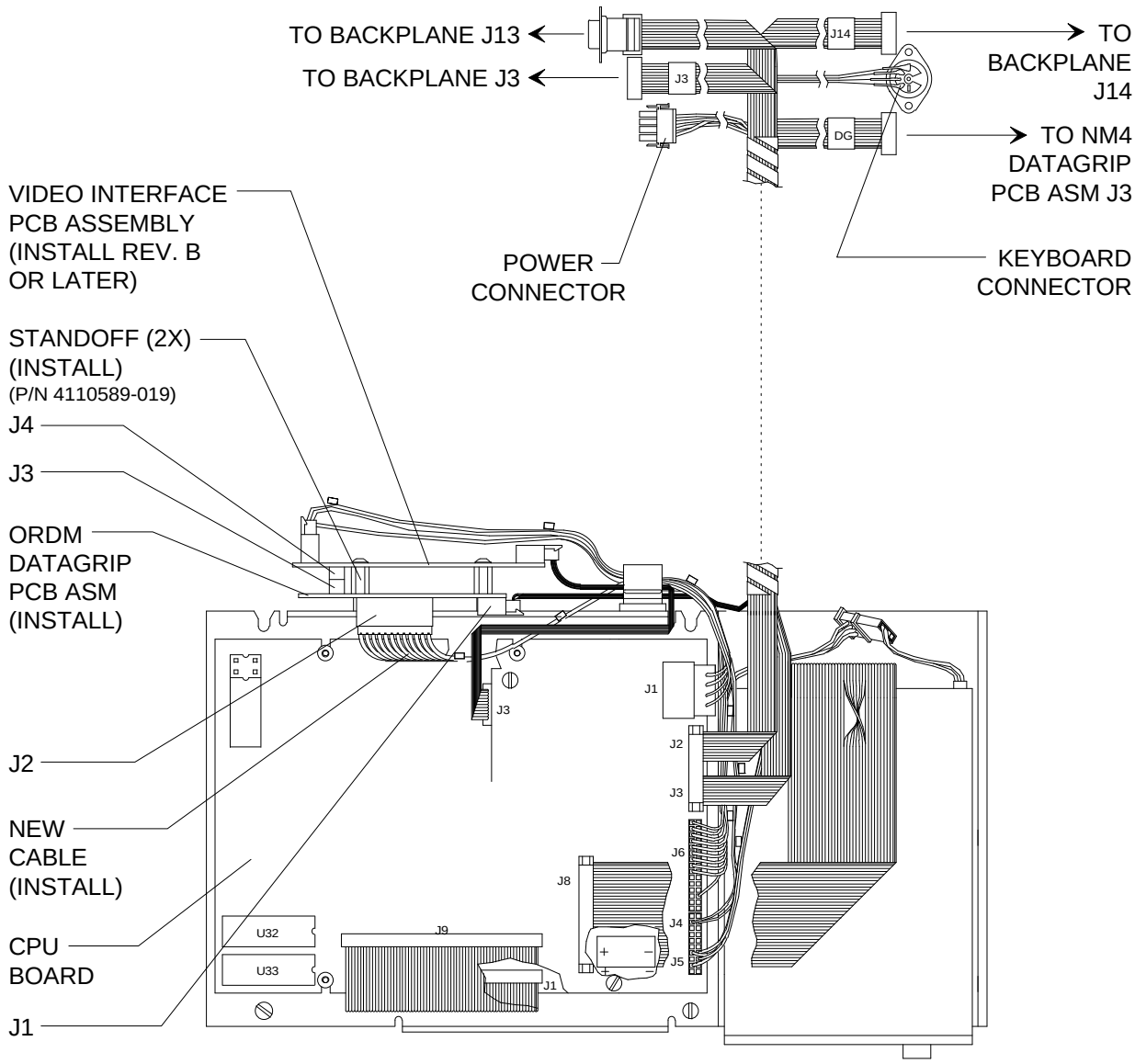
24. Install the new cable assembly (P/N 4112309) between J2 on the ORDM Datagrip board and J6 on the ORDM CPU board.

25. Connect the new cable assembly labeled DG (P/N 4112579-002) to J1 on the ORDM Datagrip board.

26. Position the ORDM sub-assembly in the ventilator box, carefully feeding the ORDM cables up into the monitor box. Slide the sub-assembly into place and secure it to the ventilator box with the captive mounting screws.

27. Reinstall the ventilator box right front panel with the screws that were previously removed.

INSTALLATION PROCEDURE (continued)



TOP VIEW OF ORDM SUB-ASSEMBLY

SP11303

Figure 3: ORDM DATAGRIP BOARD AND CONNECTIONS

INSTALLATION PROCEDURE (continued)

28. Reconnect the ORDM cables to J3, J13 and J14 on the backplane. Connector locations are shown in Figure 4.

29. Reconnect the floating ORDM keyboard and power cables. Route them through the backplane cable clamps as they were originally.

30. Connect the new DG cable to J3 on the NM4 Datagrip PCB assembly (ref. Figure 2).

31. Verify that along with the existing jumpers, there is a jumper from JP19-5 to JP19-6 on the new type backplane (P/N 4111881), or from JP19-3 to JP19-4 on the old type backplane (P/N 4110699) as shown in the detail in Figure 4.

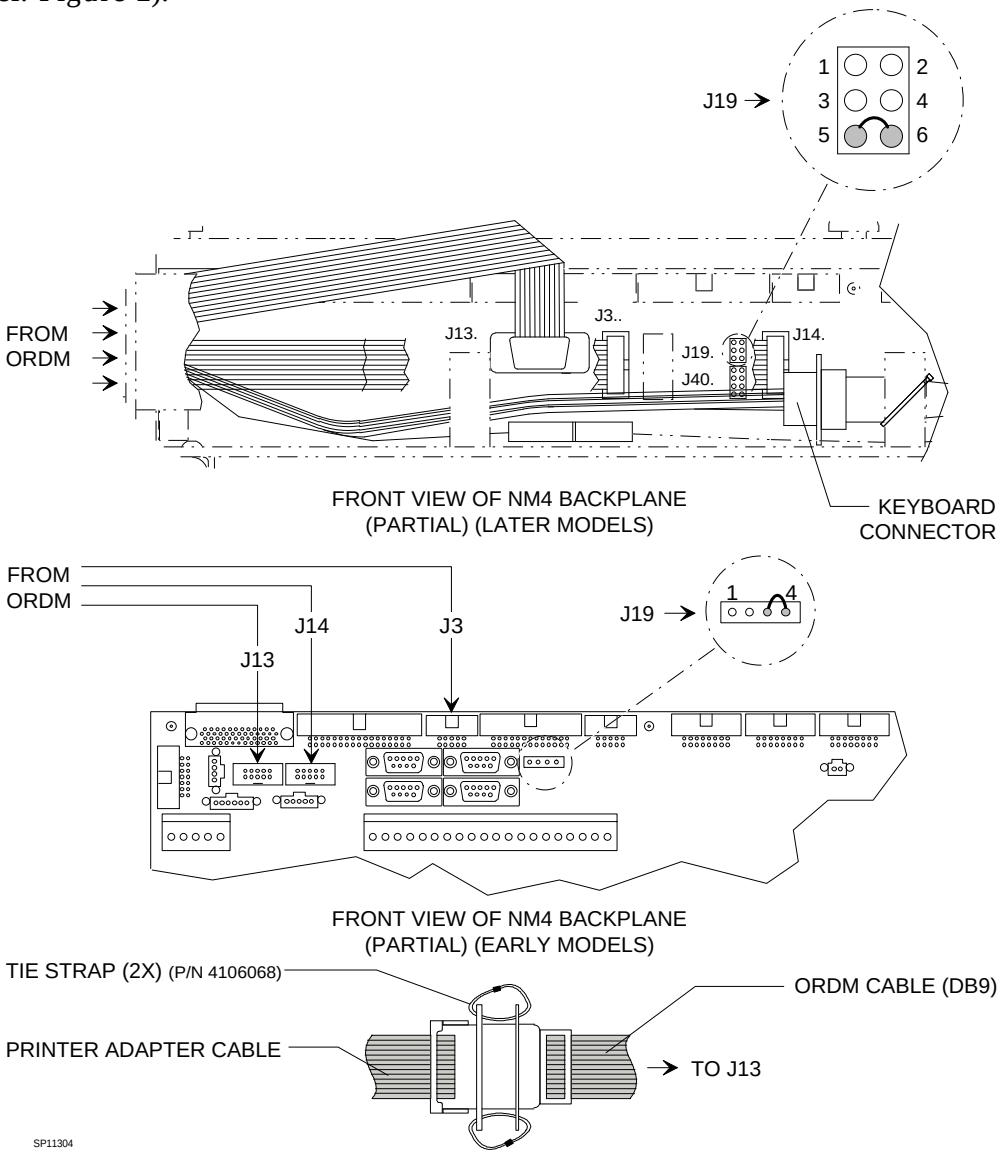


Figure 4: ORDM CABLE CONNECTIONS TO BACKPLANE

INSTALLATION PROCEDURE (continued)

32. Pull out the keyboard and verify that the EDIT and START/STOP RECORD keycaps are installed as shown in Figure 5.

If either of these keycaps are not present, remove the keyboard cover and carefully lift off the existing keycap(s). Press the new keycap(s) into place. Clean the keyboard faceplate and install a new keyboard cover (P/N 4111314).

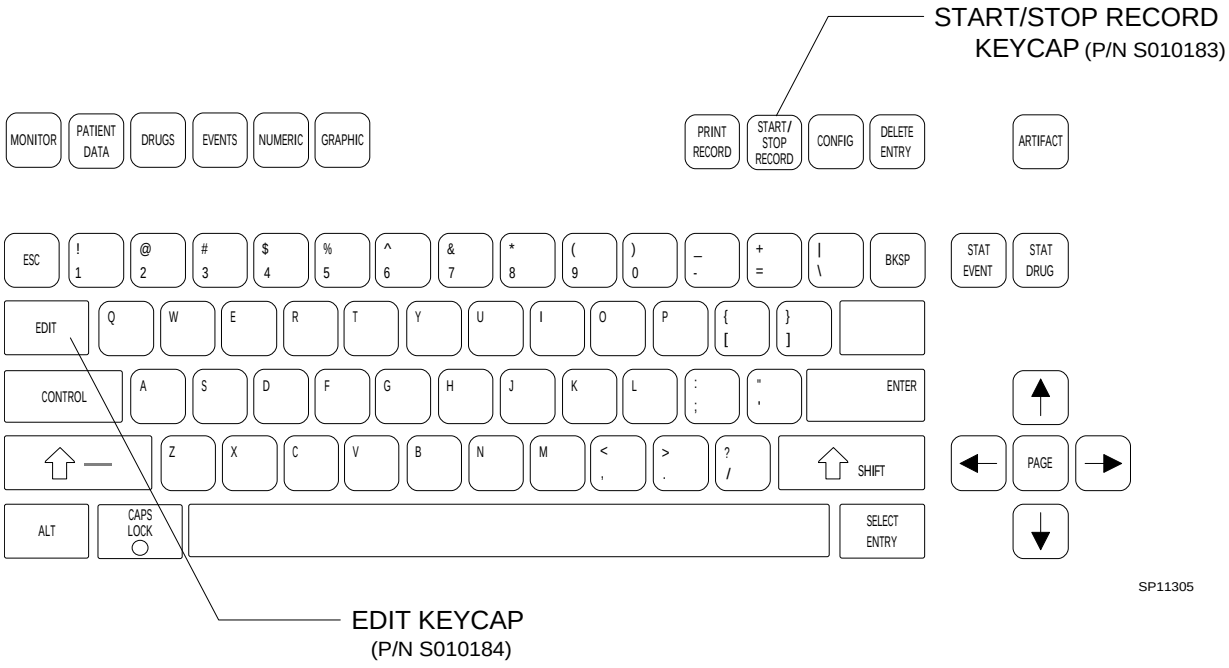


Figure 5: KEYBOARD LAYOUT WITH CORRECT KEYCAPS

INSTALLATION PROCEDURE (continued)

33. Remove the cable clamps holding the remote display cable to the underside of the boom arm.

34. Remove the plastic cap at the outboard end of the boom arm to expose the remote display mounting screw.

35. While holding the remote display assembly, loosen the mounting screw until the assembly separates from the boom arm.

36. Install the Datagrip assembly (see Figure 6) to the boom arm. Be sure the delrin spacer is in place between the assembly and the boom arm. Tighten the mounting screw to a torque of 3 to 5 foot pounds. Reinstall the plastic cap at the end of the boom arm.

37. Remove the six screws holding the rear cover of the remote display and separate the rear cover from the remote display. Use caution when separating the cover so that cables are not pulled from the display.

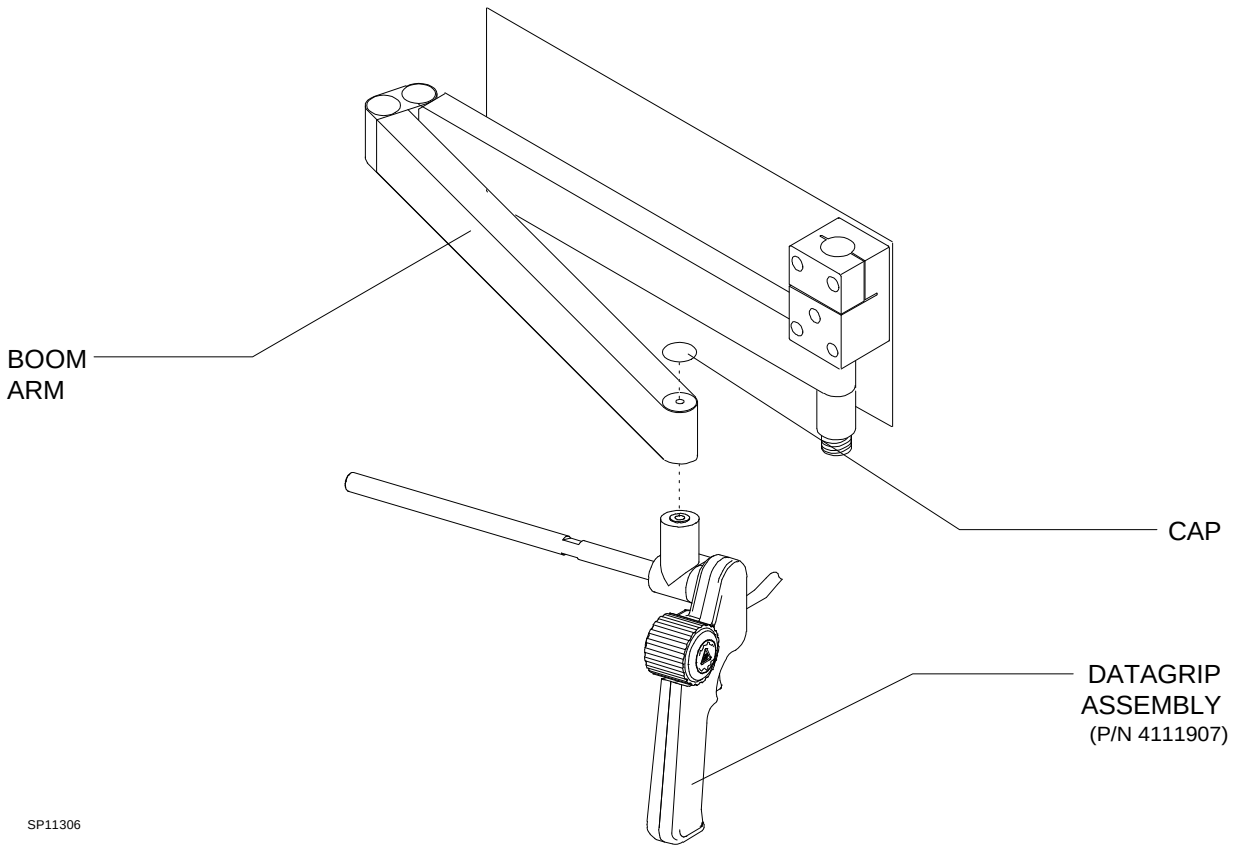


Figure 6: DATAGRIP INSTALLATION

INSTALLATION PROCEDURE (continued)

38. Loosen the remote display clamp screws. See Figure 7. Remove the outer retaining ring from the remote display mounting rod, and withdraw the rod approx. 3 in. until the end of the rod clears the first clamp. Remove the inner reaining ring and fully withdraw the display mounting rod.

39. Examine the mounting rod hole in the remote display rear cover. If the hole does not have a notch as shown in the illustration, carefully cut or file a ⅛ in. wide notch in the cover that will clear the stop pins on the new Datagrip display mounting rod.

40. Replace any cracked display mounting clamps (P/N 4112685-001 mounting blocks) at this time with the spare clamps provided in the parts kit.

41. Reinstall the rear cover on the remote display with the screws that were previously removed. (Install the two shorter screws at the bottom.)

42. Slide the remote display onto the Datagrip display mounting rod. Orient the display with its face toward the floor so that the stop pins on the rod will pass through the slots in the mounting clamps, and continue sliding the display into position.

43. Tighten the mounting clamps (accessible through clearance holes in the rear cover) until the remote display has the desired amount of friction on the mounting rod.

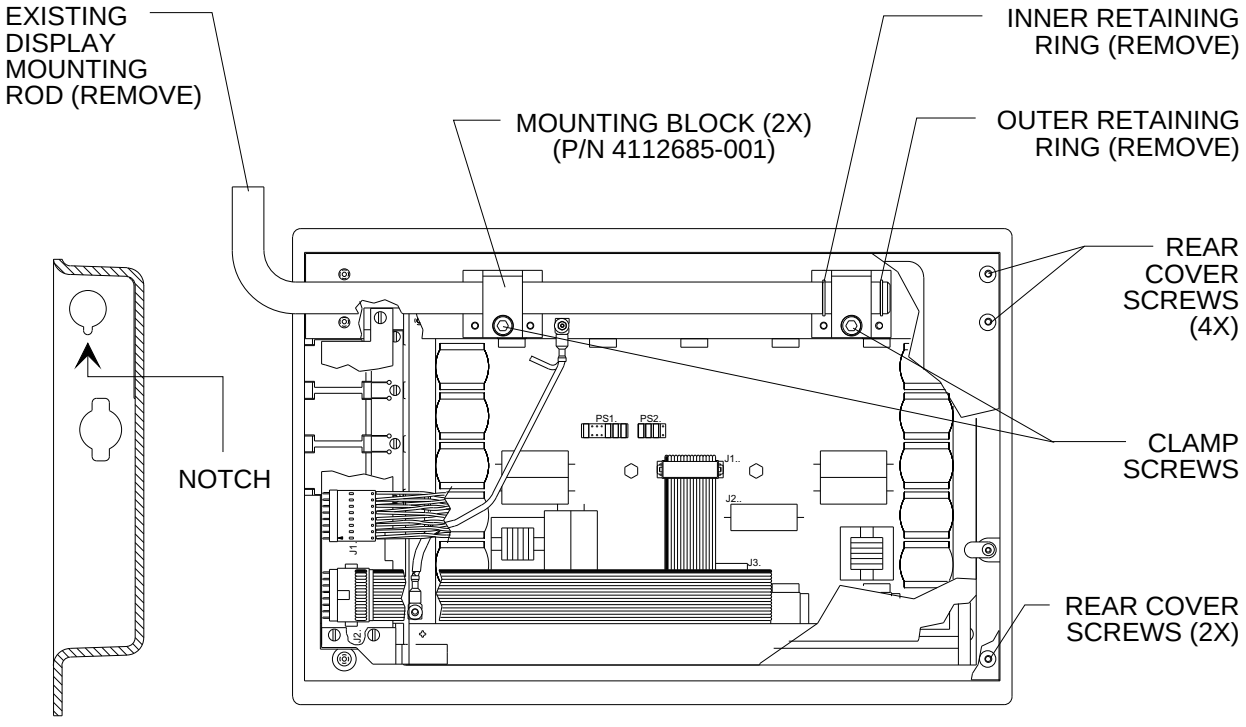


Figure 7: REMOTE DISPLAY DETAILS

INSTALLATION PROCEDURE (continued)

44. Connect the Datagrip and remote display cables to their ports on the patient interface panel as shown in Figure 8.

45. Route the Datagrip and remote display cables along the underside of the boom arm: attach the cables to the outer section of the boom arm with two ⅜ in. cable clamps. Coil the excess length of the cables and secure them to the inner section of the boom arm with two ¾ in. cable clamps.

    Ensure that the boom arm has full range of motion with no binding caused by the cables.

46. Restore power to the machine and enable the circuit breakers by pressing in their buttons.

47. Proceed to the SOFTWARE LOADING AND TEST section.

INSTALLATION PROCEDURE (continued)

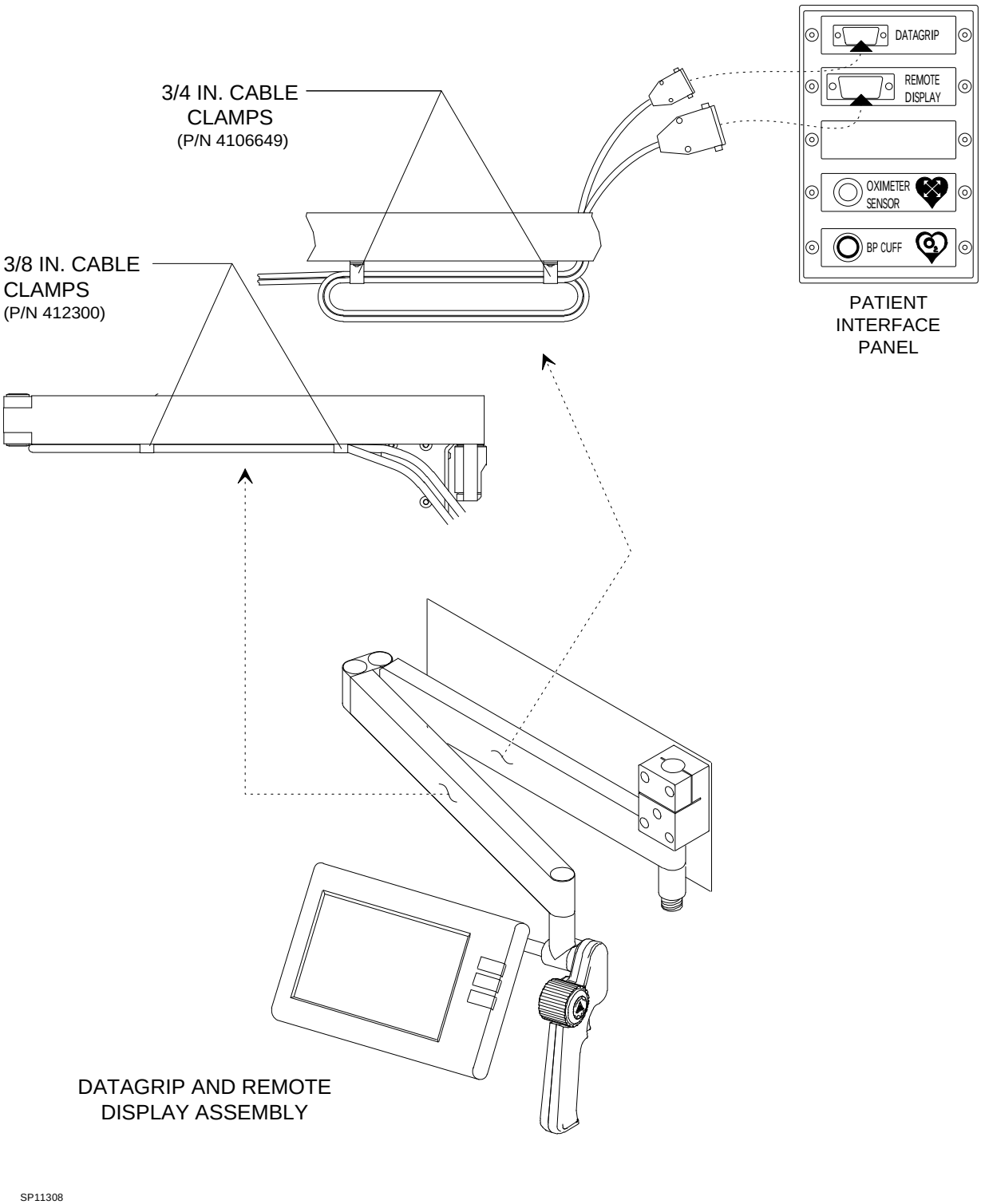


Figure 8: DATAGRIP AND REMOTE DISPLAY CABLE INSTALLATION

SOFTWARE LOADING AND TEST

NM4 Software Loading:

The following items are needed:

-- Interface Cable, NAD Part No. 4109882 P (9-pin to 25-pin) or 4110328 A (9-pin to 9-pin)

-- IBM® PC or IBM PC Compatible configured with:

- PC-DOS or MS-DOS V3.3 or higher
- RS-232C Serial Port connected to COM 1
- Hard Drive loaded with NM4 1.21 or later Software
- Modem (or external modem)

48. Call the NAD Technical Service Department and obtain the following information for downloading NARKOMED 4 Software Release 1.21 or later:

    • System configuration
    • Communications protocol
    • CRC value

49. Download the software to the hard disk on the PC.

50. Set the System Power switch on the NARKOMED 4 to STANDBY, and the power switch on the PC to OFF.

51. Connect the appropriate interface cable (9-pin or 25-pin) to COM 1 on the PC, and connect the other end of the cable to the NM4 serial interface Port A as shown in Figure 9.

52. Press and hold the MONITOR SETUP and TREND keys, and turn the System Power switch to ON. Release the MONITOR SETUP and TREND keys when the load mode screen shown in Figure 10 appears.

53. Power up the PC and wait for the DOS prompt to appear on the screen.

54. Set the PC to read the drive holding the software. For example: if the software was downloaded to drive C, type C: and press ENTER.

55. Type LOAD_NM4 and press ENTER. Note that the character between LOAD and NM4 is an underline.

56. The PC program will print the version number and ask for verification. Press ENTER to proceed. The PC screen is shown in Figure 11.

57. Verify that the CRC value shown on the PC screen matches the one obtained from the NAD Technical Service Department. After several minutes have elapsed, the NM4 will auto re-boot and will enter a power-up sequence with the new software version number displayed.

58. After the NM4 re-boots, press the ESC key on the PC.

59. Set the System Power switch on the NM4 to STANDBY, and the power switch on the PC to OFF. Disconnect the interface cable.

SOFTWARE LOADING AND TEST (continued)

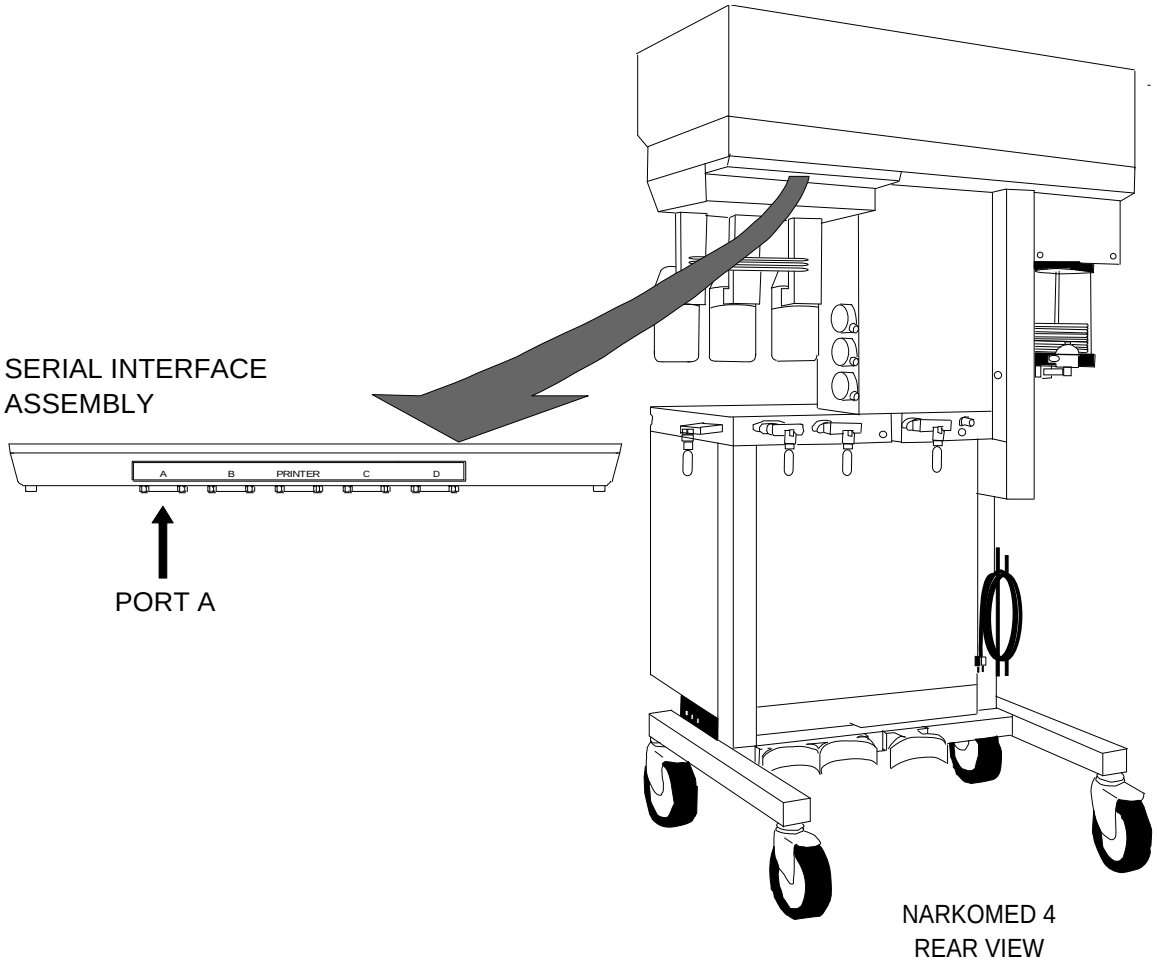


Figure 9: NARKOMED 4 EXTERNAL SOFTWARE LOAD INTERFACE CONNECTION

SOFTWARE LOADING AND TEST (continued)

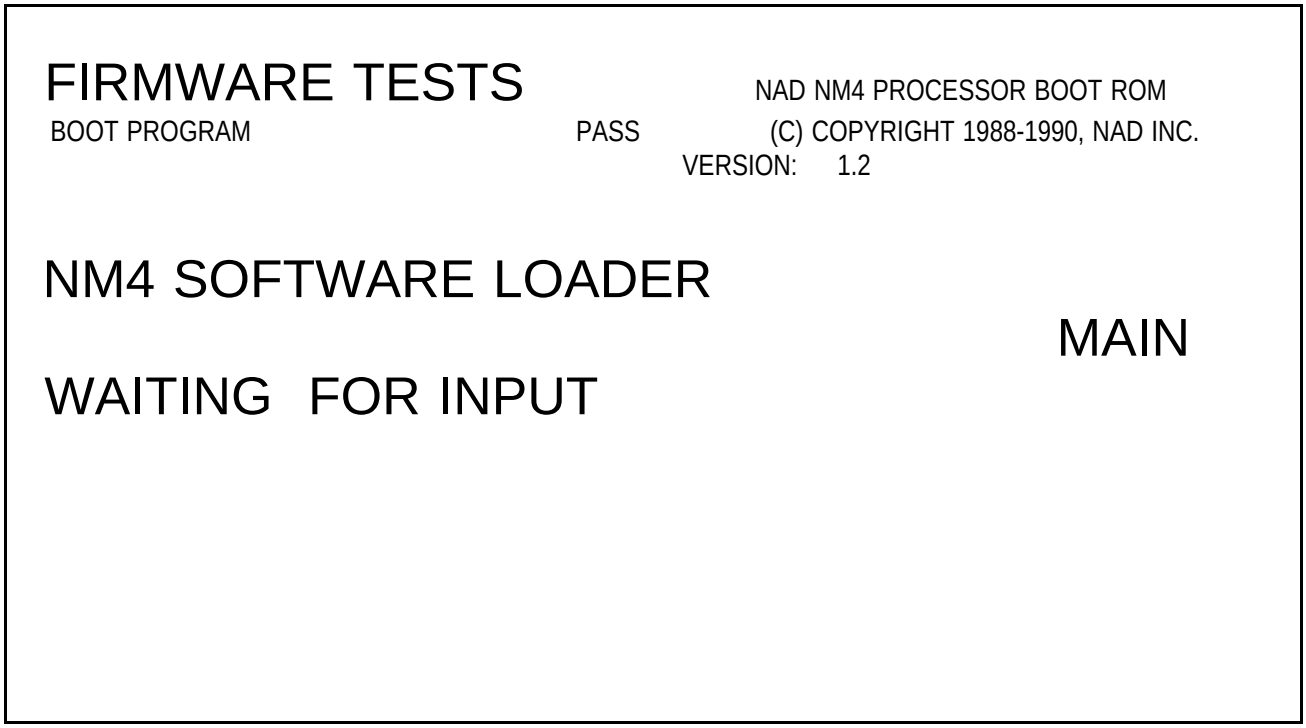


FIGURE 10: NARKOMED 4 LOAD MODE SCREEN

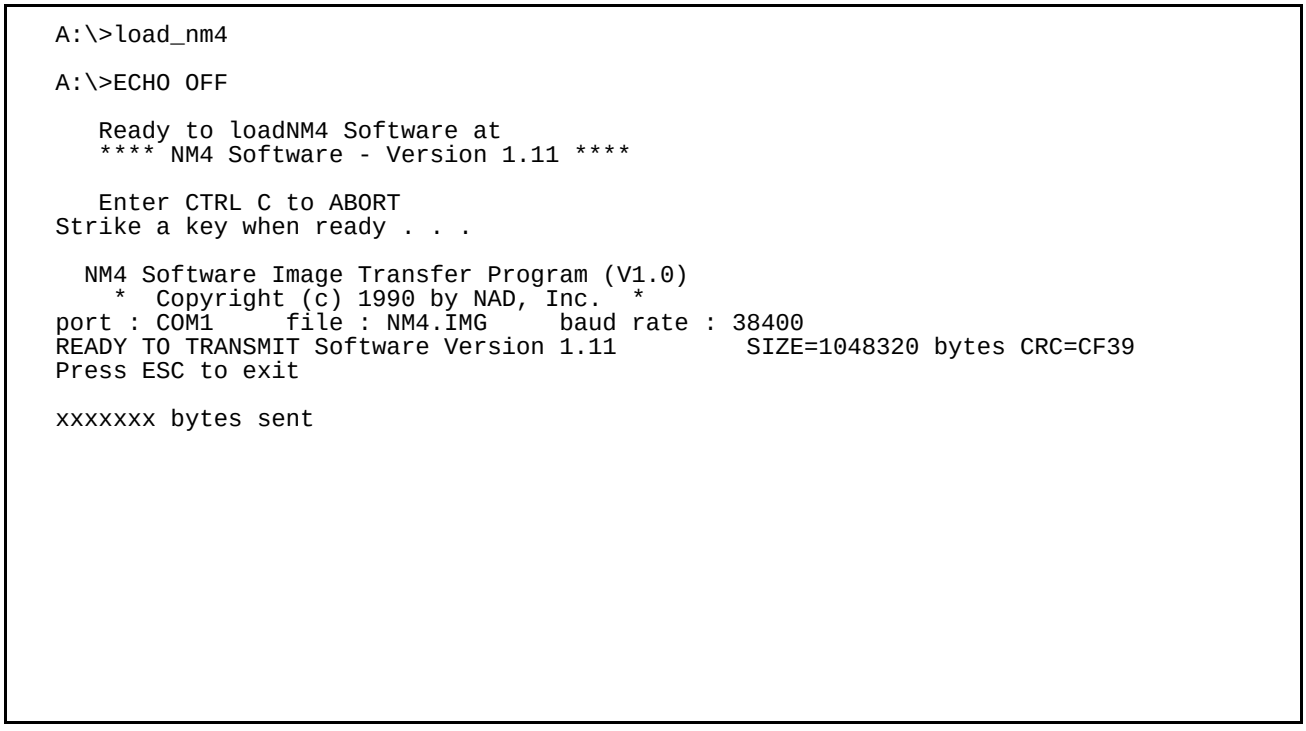

A:\>load_nm4
A:\>ECHO OFF
Ready to loadNM4 Software at
**** NM4 Software - Version 1.11 ****
Enter CTRL C to ABORT
Strike a key when ready . . .
NM4 Software Image Transfer Program (V1.0)
* Copyright (c) 1990 by NAD, Inc. *
port : COM1 file : NM4.IMG baud rate : 38400
READY TO TRANSMIT Software Version 1.11 SIZE=1048320 bytes CRC=CF39
Press ESC to exit
xxxxxxx bytes sent

FIGURE 11: SOFTWARE LOAD PC SCREEN

SOFTWARE LOADING AND TEST (continued)

NM4 Test:

60. Turn the System Power switch to ON.

61. Following the power-up diagnostics, verify that the Datagrip softkeys appear on the remote display. If a stacked gas bar appears, check the cable connection from the backplane to the NM4 Datagrip board. Replace the cable or NM4 Datagrip board if necessary.

62. Press the BACKUP hard key. Verify that the Datagrip softkeys appear on the remote display when the backup processor is selected. If a stacked gas bar appears, swap the processors.

63. Rotate the Datagrip selector wheel and verify that the cursor moves correctly on the remote display. Pull the Datagrip trigger and verify that the selected softkey highlights.

    If the Datagrip does not function properly, check the external connection to the interface panel, and the internal connection from the interface panel to the NM4 Datagrip board.

NOTE: If the image on the remote display is not stable following the Datagrip installation, contact the NAD Technical Service Department.

NOTE: Skip to Step 80 if the machine does <u>not</u> have an ORDM.

ORDM Software Update:

64. Turn the System Power switch to STANDBY.

65. Insert the ORDM Software (2.0 or later) Program Disk into the disk drive, pressing it in until it locks into place. See Figure 12.

66. Turn the System Power switch to ON, and wait for the Monitors screen to appear on the display.

67. Press and hold the MONITOR and SYSTEM CONFIG keys, and press the Selection Dial to enter the Main Service Screen as shown in Figure 13.

68. Touch the PERIPHERALS soft key at the bottom right of the service screen.

SOFTWARE LOADING AND TEST (continued)

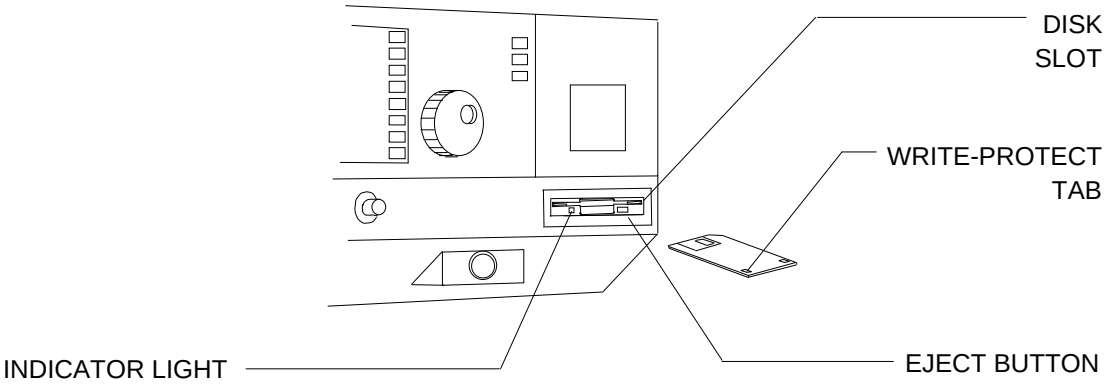


Figure 12: O.R. DATA MANAGER DISK DRIVE

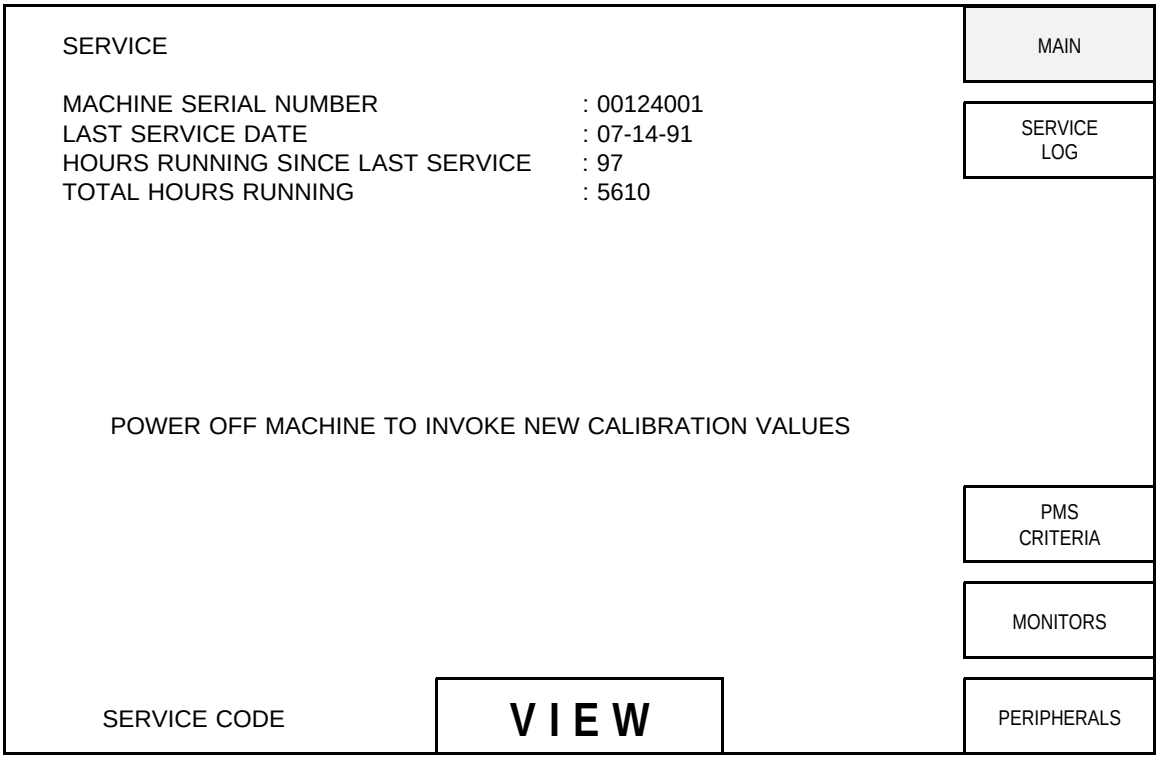


Figure 13: VIEW MODE SERVICE SCREEN

SOFTWARE LOADING AND TEST (continued)

69. Touch the Remote Panel Relay ORDM soft key (see Figure 14) on the Relays Status and Control Screen.

70. Observe the remote display during the procedure. Downloading is complete when the message "REMOVE THE FLOPPY DISK FROM THE FLOPPY DRIVE AND DEPRESS ANY KEY" appears on the remote display.

71. Press the eject button on the disk drive. The disk will partially self-eject from the drive.

NOTE: Be sure to remove the disk before pressing the spacebar.

72. Remove the disk from the disk drive and press the spacebar on the O.R. DATA MANAGER keyboard.

73. Touch the Remote Panel Relay NM4 soft key on the Relays Status and Control Screen.

74. Press the MONITOR key on the NARKOMED 4 panel.

75. Wait for the "ORDM NOT REC" message to appear on the remote display advisory column.

76. Press the START/STOP key on the ORDM keyboard.

77. Insert a blank patient data disk in the ORDM disk drive and press the spacebar. When the message "OK TO CLEAR PREVIOUS CASE FROM DISK" appears, press the Y key. When the message "ARE YOU SURE" appears, press the Y key again.

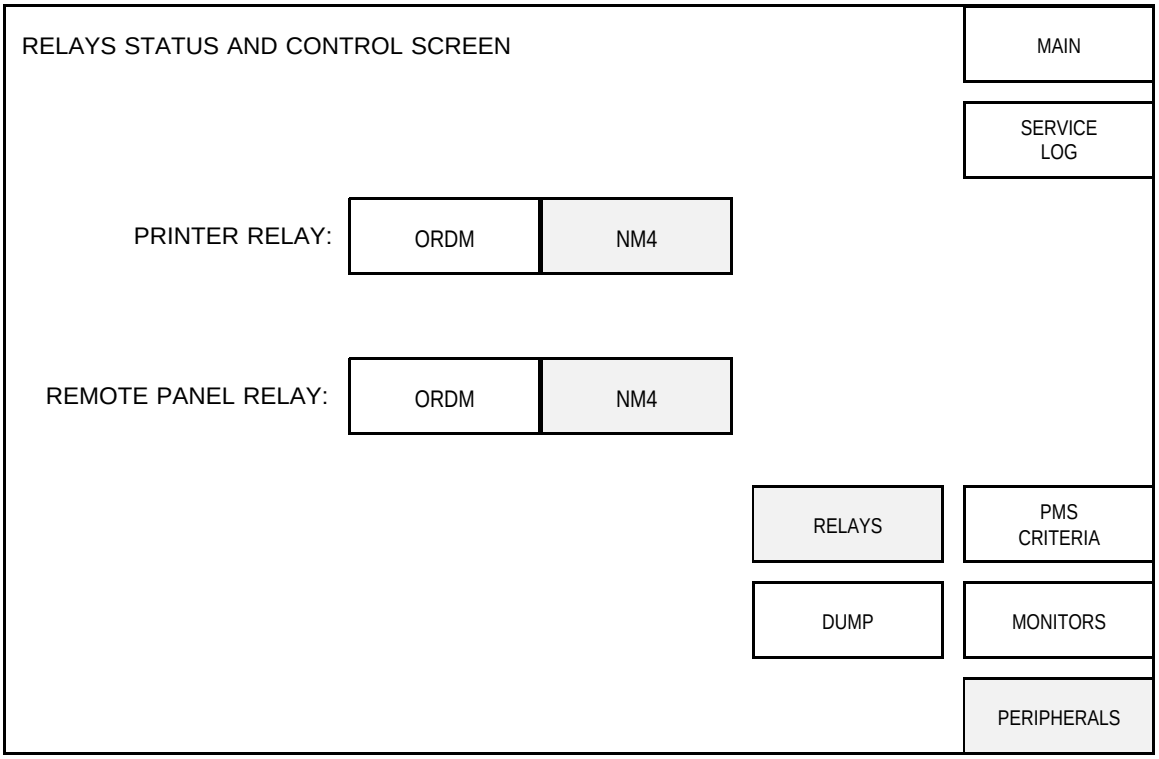


Figure 14: RELAYS STATUS AND CONTROL SCREEN

SOFTWARE LOADING AND TEST (continued)

78. When the patient name and/or ID screen appears, enter a "1" in the patient ID block and press the ENTER key twice to advance the cursor and start the case.

79. Verify that the software has been properly downloaded: On the keyboard, press and hold the ALT key, and press the V key. The window shown in Figure 15 will appear at the center of the remote display for approximately three seconds. The current software version number shown on the remote display should agree with that marked on the program disk or its accompanying documentation.

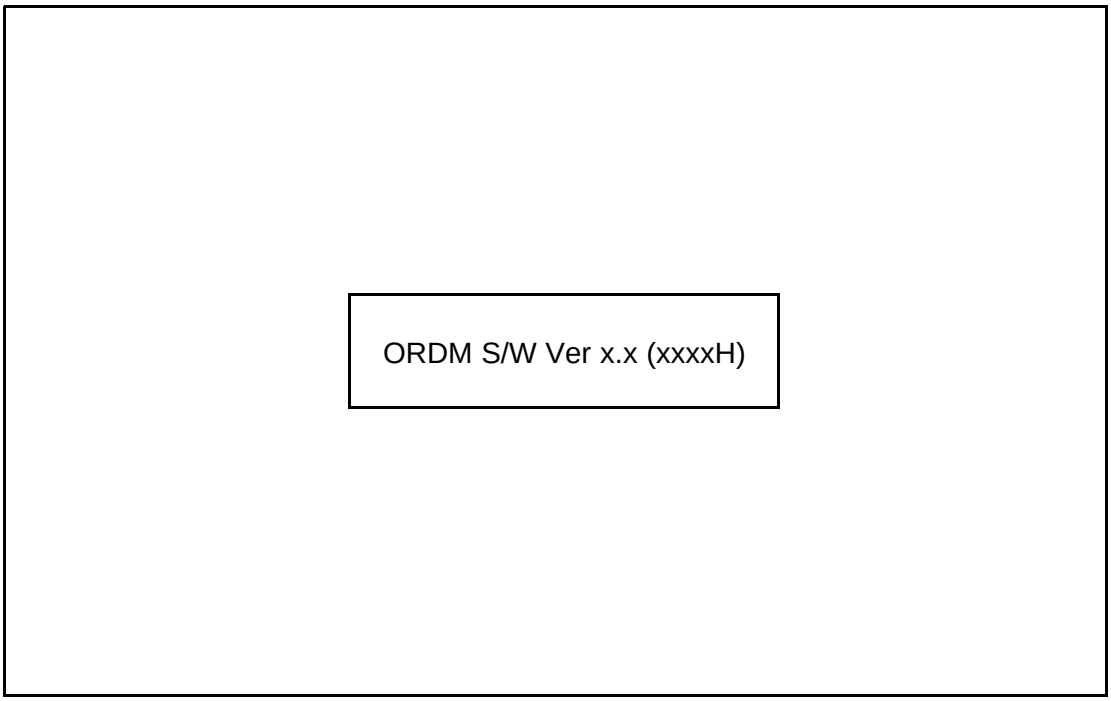


Figure 15: SOFTWARE VERSION WINDOW

80. Turn the System Power switch to STANDBY.

81. Disconnect the remote display and Datagrip cables from their ports on the patient interface panel.

82. Reinstall the monitor box cover.

83. Reinstall all connections to the patient interface panel.

84. Ensure that an updated copy of the Operator's Manual (P/N S4111402) accompanies the machine.

85. Perform a complete PMS on the machine.

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Rev: B
Date: May 30, 1996
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